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PHOTO HAWAII

HAPPY HAWAIIAN VISITORS GLIDE TOWARD WAIKIKI BEACH ON THE SLOPE OF A BREAKER. DIAMOND HEAD, AN EXTINCT VOLCANO (Bulletin No. 3) LOOKS ON

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Bulletin No. 1, April 16, 1951

Iranian Oil Brews Storm over Middle East

WHEN the wind blows down the Shatt al 'Arab, skullcapped Iranian fishermen are apt to grimace, jerk a thumb upstream, and say:

"Naft . . . phui!"

"Naft" is Persian for petroleum. "Phui" is the world-wide reaction to the smell of an upwind oil refinery. And on the Shatt al 'Arab near the head of the Persian Gulf is Abadan, world's largest single processing plant for crude petroleum and storm center of current Iranian proposals to nationalize the country's British-operated oil industry.

Abadan Was Desert 40 Years Ago

The present tension in Iran reveals how closely the nation's destiny is linked to oil. Ancient Persia is today the world's fourth-ranking oil producer. Its lonely pipelines and wells, crisscrossing the foothills of the Zagros Mountains (illustration, inside cover), lace together East and West. The Anglo-Iranian Oil Company, valued at more than $500,000,000, is far and away Iran's largest business concern.

Abadan, an oil city of some 140,000 people, only 40 years ago was a deserted spot on a long sandy island in the sun-baked delta below the junction of the Tigris and Euphrates rivers. In a great geologic trough beneath the Mesopotamian river basin waited a hidden treasure. It remained for an Australian wildcatter named William Knox D'Arcy to drill 1,180 feet through Iranian limestone and bring in a gusher in 1908.

Wild tribesmen had ridden into Persia thousands of years before and found oozings of gummy black bitumen to fire their lamps and bind the materials of their buildings, tools, and weapons. Alexander the Great marched through Persia, his horsemen collecting naphtha and pitch from evil-smelling pools to strike blazing terror among the war elephants of enemies he met later.

Zoroaster's fire-worshipers built sacred temples to guard mysterious pillars of flame in Persia's barren hills. Natural gas and seeping oils fed their eternal fires. Close by the ruins of what may have been a Zoroastrian temple, D'Arcy drilled.

Darius Carved Mountainside

Masjid-i-Sulaiman—"Mosque of Solomon"—became the name of an oil field which has yielded a billion barrels, making it one of the richest in the world. Other fields followed: Haft Kel, Naft Safid, Agha Jari, Gach Saran, and Lali. The refinery at Abadan, with its giant tank farms, now feeds liquid energy to Britain, the nations of Western Europe, and as far east as Australia.

Naft-i-Shah oil field on the Iran-Iraq frontier serves Iranian oil needs through a small refinery at Kermanshah. Near by are the pompous mountainside carvings of Darius the Great—Mount Bisitun's stone sculpture (illustration, next page) which gave the world the key to long-forgotten languages and the cuneiform script.

ENTERED AS SECOND CLASS MATTER APRIL 27, 1943, POST OFFICE, WASHINGTON, D. C., UNDER ACT OF MARCH 3, 1879.
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ERNEST B. SCHOEDSACK

THE ZAGROS MOUNTAINS, HAUNT OF NOMADIC TRIBESMEN, ARE THE SOURCE OF MUCH IRANIAN OIL (Bulletin No. 1)

"Big Tops" Grow as Circuses Become Scarce

AS another big season starts, circus lovers are facing the prospect of an ever-dwindling number of "big tops." A half-dozen circuses closed during the 1950 season, the Circus Fans Association of America has pointed out with alarm. Only ten remained of the scores which once flourished in the United States.

America's spangled show of feats and freaks, of wild animals and wistful clowns, has had many ups and downs since it first took to railway wheels more than three-quarters of a century ago. Today the paradox of the "Greatest Show on Earth" is that, while numbers dwindle and costs mount, the remaining outfits grow bigger and more spectacular.

A Traveling City

Last year the largest of the rolling shows traveled some 19,000 miles, used 32 railroads, and gave 415 performances before nearly 3,500,000 people. It carried motorized caravans of set-up seats, and spread the world's biggest piece of canvas—30,000 square yards of it—in a tent that can now be raised by mechanical stake drivers and tractor power.

A major circus is a traveling city, complete with a thousand and more inhabitants, its own doctors, veterinarians, and dressmakers; its own electric power, restaurant, sleeping cars, barber shop, post office, and fire department. In the age of machinery, it even takes along a blacksmith shop. Circus people have their own music, including the shrill-voiced calliope, and art, including the flamboyant poster. They speak a language of their own, with a vocabulary as incomprehensible to the uninitiated as that of be-bop.

American energy, plus talent from both the old and new worlds, has created a special modernized version of the circus. Present-day Europe, too, has its characteristic performances, many of which are "stationary" ones in theaters of London, Paris, Moscow, and elsewhere. Latin American impresarios, faced with mountain barriers, have given a new twist to circus transport by taking to the air.

Basically, however, the tradition of the circus and its classic forms goes back more than 2,000 years—to Romans cheering chariot racers, tumblers, and rope dancers in arenas such as the Circus Maximus (the biggest). Later, these exhibits gave way to cruel contests between men and beasts, and eventually, with Rome's decline, the spectacles ceased.

George Washington Was Circus Fan

The circus spirit, however, lingered on in the horse fairs of the Middle Ages and wandering troupes whose collection box was often filled by admirers of performing bears or other trained animals.

The modern circus is credited to 18th-century England and an ex-cavalryman who enlivened his London horse show with acrobatics and clown acts. The popular feature soon spread to the European continent and to the young United States, where the Ricketts Circus of Philadelphia, in 1793, counted George Washington among its admirers.

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Iranian nationalists have also laid verbal claim to Bahrein, oil-rich island across the Persian Gulf where Arabian dhows put in bearing huge milky pearls from the sea floor. Persia has been claiming Bahrein without avail since 1783, however. An independent sheikdom under British protection, Bahrein is the site of an American oil field and refinery.

Saudi Arabia's oil wells were joined with the Mediterranean coast in 1950 by the completion of Tapline, a 1,068-mile, 30-inch pipeline across the burning Arabian desert. American and British engineers have proposed to build next an even bigger "Middle East Inch" (34-36 inches in diameter) from Abadan to the Mediterranean.

Iran's oil would thus be linked by a tunnel of steel with the Western world—if hot political winds from Tehran do not blow the project away.

NOTE: Oil wells and pipelines of the Iran region may be located on the National Geographic Society's new map of Asia and Adjacent Areas. Write the Society's headquarters, Washington 6, D. C., for a price list of maps.

For additional information, see "Ancient Mesopotamia: A Light That Did Not Fail," in the *National Geographic Magazine* for January, 1951; "Darius Carved History on Ageless Rock," December, 1950; "I Become a Bakhtiari" and "Beside the Persian Gulf" (23 color photographs), March, 1947; "Mountain Tribes of Iran and Iraq," March, 1946*; "Iran in Wartime," August, 1943*; "Forty Years Among the Arabs," September, 1942; and "Old and New in Persia," September, 1939. *(Issues marked with an asterisk are included on a special list of Magazines available to teachers in packets of ten for $1.00; issues unmarked are 50¢ a copy.)*

See also, in the GEOGRAPHIC SCHOOL BULLETINS, February 12, 1951, "Iran Again Plays Crossroads Role"; and "Iraq's Past Is a Blueprint for Its Future," December 18, 1950.

MAYNARD OWEN WILLIAMS

"I AM DARIUS, KING OF KINGS." "LOOK ON MY WORKS, YE MIGHTY, AND DESPAIR"

So might the ancient Persian monarch (hand upraised) be saying to nine captive kings carved on the face of Mount Bisitun in Iran. Before its modern restoration, however, the decay and erosion of ages had all but ruined Darius's limestone billboard.

Mauna Loa's Fireworks Are Hawaiian Asset

MAUNA LOA, the peak on the Island of Hawaii whose eruptions make headlines everywhere, has the reputation in its home islands of being a rather benevolent volcano and a welcome moneymaker.

It has never caused a known death in historic times, although there is always a chance that its frequent pyrotechnics may spoil the record.

Mauna Loa is the world's most active volcano and greatest mountain mass. Its base goes down 18,000 feet below sea level. It is 60 miles in diameter and 200 miles in circumference at sea level.

Volcanologists Can Foretell Eruptions

Mauna Loa produces huge amounts of lava, but its explosions seldom cause the widespread ash and rock showers which may bring sudden death. A tourist boom follows each eruption and all the islands benefit. Such extinct craters as Diamond Head on Oahu (illustration, cover) and Maui's Haleakala, and Kauai's barking sands charm travelers to the islands.

Because the scientists in charge of the Hawaiian Volcano Laboratory are able to predict eruptions with reasonable accuracy, these outbreaks do not catch either residents or the tourist bureau unprepared.

During the most recent activity—that of June, 1950, most violent in Mauna Loa's history—motion picture producers were able to take advantage of this scientific soothsaying in a really spectacular way. Having advance notice of the probable eruption of Mauna Loa's summit crater, Mokuaweoweo, the director of a picture whose climax involved an active volcano was able to obtain authentic footage for the production.

The island owes its best tourist attraction to a 1,600-mile crack in the floor of the Pacific Ocean. Tnis tremendous fissure in the earth's surface permitted Mauna Loa's birth ages ago.

Frequent Eruptions Lessen Danger

When the earth's "crust" is of inferior strength, the fluid and immensely hot substratum may rush upward. It was thus that the Hawaiian Islands came into being. Mauna Loa is an escape point for molten rock from many miles deep within the core of the earth. Since 1823, when the records were begun, Mauna Loa has been erupting on an average of every three and a third years.

The frequent activity of this particular volcano is probably the reason why its explosions have not been more destructive. The lava vents of long-dormant volcanoes become choked, and when they do explode the "stopper" of rock and ash is blown far and wide.

Mauna Loa's crest, 13,680 feet high, has a deep pit nearly two miles wide and twice that long. Lava spewing from this trapdoor formed the mountain, but the thunderous discharges which, from time to time, have come from recent outbursts, erupt from vents at lower levels.

Hilo, largest community on Hawaii, has had two spectacularly narrow escapes from Mauna Loa's wrath. A lava flow stopped just a half mile from the city in 1881. During a 1935 eruption Navy fliers saved Hilo from a molten river by dropping 6,000 pounds of bombs in order to divert the

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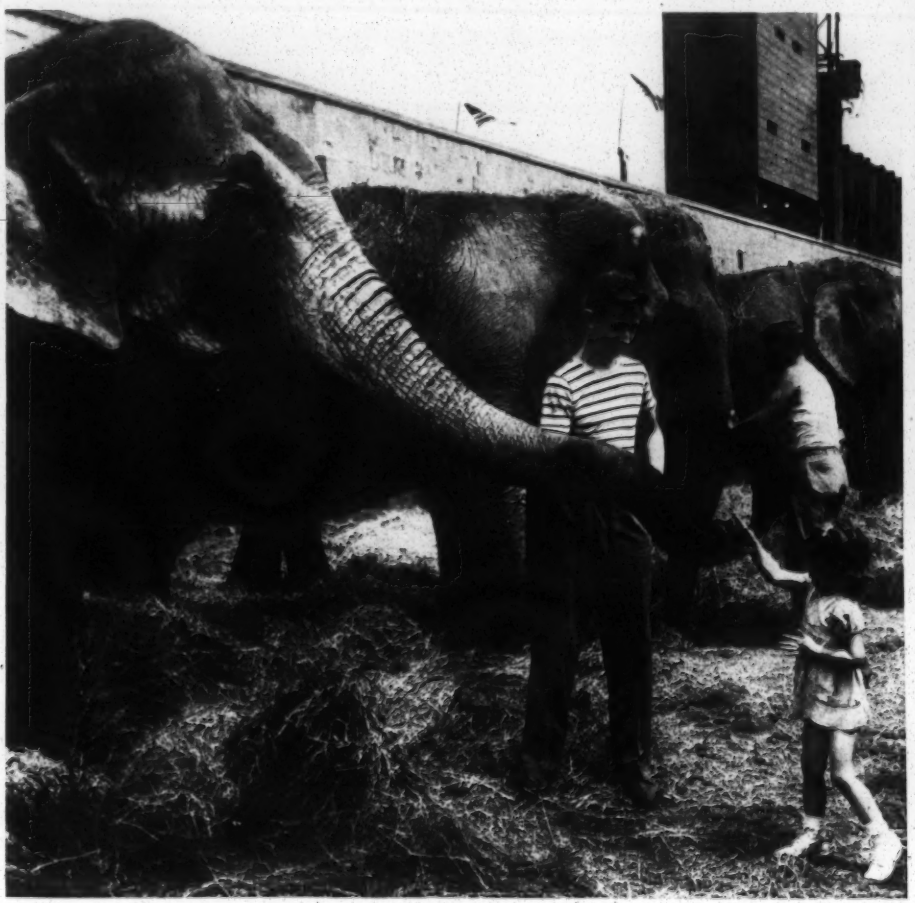
The novelty of the canvas top, "ponderous pachyderms," (illustration, below), and the wild-beast menagerie came afterward. So did the big parade, which (before traffic crowded it off most city streets) dazzled prospective audiences with tantalizing hints of wonders to come.

Until after the Civil War, an elephant with perhaps a couple of lions was considered standard animal display. Today's circuses are Noah's Arks of all kinds of animals, presenting natural-history lessons that link the shows with their stationary relatives, the public zoos.

NOTE: For additional information, see "The Wonder City That Moves by Night" and "Circus Action in Color" (32 color photographs), in the *National Geographic Magazine* for March, 1948; and "Land of Sawdust and Spangles" (with 29 color photographs), October, 1931.

See also, in the GEOGRAPHIC SCHOOL BULLETINS, April 5, 1948, "Circus Billposters Make Spring 'Official.'"



LAWRENCE D. THORNTON FROM THREE LIONS

TWO YOUNG CIRCUS FANS COOPERATE; JUMBO GETS A FREE PEANUT

Circus elephants not only perform under the big top, but earn their hay by helping to raise the huge center poles. They do other jobs that would require trucks or tractors without them. With their trunks they throw hay and dirt on their backs to keep off insects.

Helicopters Come of Age in Korea

AN "angel" with a whirling halo watches over the GIs fighting in Korea. In ridiculous denial of the law of gravity, by a sort of thrashing, clattering magic, the helicopter may be rewriting the future of army mobility in combat.

"Windmill . . . eggbeater . . . puddle-jumping pogo stick," fighting men call it. There are other indiscriminate names ranging from "Hellico Peters" to "the infuriated palm tree."

Flying Jeep, Truck, and Ambulance

But literally hundreds of lives have been saved by the ungainly helicopter, serving as a jack-of-all-duty throughout the combat zone. Less than a dozen years after the first such contraption wobbled into the air in this country, the Army, Navy, and Air Force can now say:

"We have a flying jeep and a flying truck. We are working on a flying boxcar and a flying crane. None of these will need roads or airfields. They can land anywhere, fly in any direction, or stand stock-still in mid-air. Helicopters are tomorrow's flying mule trains."

The helicopters being used in Korea are mainly of the "flying jeep" size. With their aid, hundreds of wounded soldiers, downed fliers, and encircled troops or patrols have been snatched to safety straight up into the skies. For ambulance service alone helicopters have won the name of guardian angel in Korea.

These small sky busybodies stand crash guard over aircraft carriers, direct shore bombardment or artillery barrages, spot mine fields, lay telephone wires, carry mail or generals, and deliver food and ammunition to infantrymen where no other machine or even pack mules could go.

From Leonardo to Sikorsky

In the United States, helicopters which carry eight, ten, or twelve men are now operating. So, too, are larger editions, the big "flying bananas," capable of transporting 27 passengers. Jet-propelled baby helicopters, whose rotor-tip engines have no moving parts, have been tested. Huge ships which can carry up to ten men, or pick up a tank, truck, or field gun, are being built and ground-tested. "Capsule" helicopters, carrying a cargo "pod" the size of a cross-country bus, are beyond the idea state; the first is scheduled for delivery this year.

Thus is being fulfilled one of man's oldest dreams of flight. Helicopterlike devices were designed—on paper—by prophets of flying, centuries ago. Leonardo Da Vinci drew such a plan. But only since the middle 1930's have there been true helicopters capable of hanging in mid-air under complete control by a human pilot. Igor Sikorsky flew the prototype of today's helicopter in 1939 for the first time.

Until the Korean war began, fewer than 1,200 helicopters had been built in America. Yet they had already begun to do such diverse jobs as fighting fires, carrying mail, surveying Alaskan glaciers, dusting farm crops, exploring volcanoes, harpooning whales, and lifting church steeples. Dr.

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flow. The eruption of June, 1950, sent several streams of lava flowing down into the ocean. Fortunately, these did not flow toward Hilo.

Where the flows met the sea, jets of steam shot red-hot rocks and lava as much as 40 feet into the air. A mile off shore the ocean was boiling hot. During the extraordinary eruption automobiles loaded with sightseers jammed the highways of the "Big Island," as Hawaii is called. Air lines diverted regular flights to show passengers the flaming pageant, and local planes flew more than 1,200 people over the volcano during the first two days of its "engagement."

The awesome beauty of volcanoes in action has created many Hawaiian legends. Burning cones are pits dug with a magic spade by Pele, goddess of fire. When mountain giants sear air and countryside with fiery breath, Pele and her sisters are dancing deep within the craters.

NOTE: The Hawaiian Islands are shown on the Society's map of the Pacific Ocean and the Bay of Bengal, on which they appear in a large-scale inset.

See also, "Because It Rains on Hawaii," in the *National Geographic Magazine* for November, 1949; "American Pathfinders of the Pacific," May, 1946*; "Life on the Hawaii 'Front,'" October, 1942; and "Hawaii, Then and Now," October, 1938.

U. S. AIR FORCE, OFFICIAL

AT THE FIREPIT'S EDGE, VISITORS TO KILAUEA CRATER GAZE SPELLBOUND INTO THE FLAMES

For countless ages, lava, flowing down Mauna Loa's slopes, has piled up, merging Kilauea—a separate volcano and probably once a distinct mountain—with the higher peak. Kilauea is sometimes called "Mauna Loa's eastern crater." At a height of 4,090 feet above sea level, Kilauea has many more visitors than Mauna Loa's summit crater, Mokuaweoweo, which crowns the 13,680-foot mountain.

Cape Cod Proud of Cottage Bearing Name

CAPE COD and the house it gave America both continue to hold major roles in the current nation-wide building boom.

New buildings are mushrooming along the 65-mile length of Massachusetts's coastal playground (map, next page). In spite of the greatest construction activity of its history, however, Cape Cod still takes pride in the originals—and most perfect examples—of the cottage which caught the interest of home-lovers across the continent.

First Settlers Developed It

These originals have set the pattern for thousands of small new houses —3,000 in one Massachusetts development alone. Settling on the land from Maine to California and Duluth to New Orleans, the trim Cape Cods have an all-American quality which may well be the secret of their success.

A mere 75 years after the Pilgrims first touched soil of the new world at the cape's tip in 1620, the Cape Cod cottage was an established part of the New England scene. Although reminiscent of the farm homes of England, it was a distinctly American creation, developed by the first settlers in answer to climatic, material, and labor problems.

Its basic design was simple, comfortable, and expandable. It consisted of a rectangular building a story and a half high, set close to the ground, and free of porches and other architectural embellishments distasteful to the Puritan nature. It could start small—as a "half house" or "three-quarters house"—and grow to a "full house" with the increase in size and means of a family.

It was, as Thoreau said, a "sober-looking" house, but it was also snug, sturdy, and beautiful in its proportions. A "full house" was distinguished by the position of the front door, centered on the long side and flanked by two windows. The dominant feature was a huge center chimney with three fireplaces—two small ones for the parlor and master bedroom on the front and a big one for the combination kitchen, dining, and living room on the back.

Kitchens to Breezeways

Although the house style seemed ideal for New England, it did not spread rapidly across the country until the 1920's. Then, in the exploitation of Cape Cod as a summer resort, promoters recognized the charm and economy of the native cottage. Hundreds were built to accommodate the influx of summer vacationers.

These visitors carried the vision of the Cape Cod house back with them and, during depression days of the 1930's, were especially attracted by its low construction cost. As the cottage grew in favor, changes in its design were effected for modern living. Dormer windows and extra bathrooms were added, summer kitchens became breezeways, and carriage rooms were converted to garages.

Bartholomew Gosnold, an English navigator, sailed along the cape in 1602. Though far from the first to see, or even to land on Cape Cod, he is

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Matthew W. Stirling recently used a helicopter in Panama while conducting archeological exploration for the National Geographic Society.

Late in 1950 the Army announced it was organizing helicopter transport companies. Attached to combat elements, 23 machines to a unit, these groups are designed to take men, equipment, and supplies across bridgeless rivers, over mountain peaks, across roadless jungles or swamps.

Army air specialists in Washington predict that helicopters will one day eliminate forward medical aid stations in combat areas, since helicopter ambulances can take casualties directly to base hospitals. They also expect helicopters to reduce the need for the build-up of advance supply dumps, because the awkward-looking aircraft can shuttle supplies forward from major ports or bases far in the rear.

Just as the truck and tank eclipsed the horse and mule in military service, these experts say bluntly that the helicopter is making it possible now for "the Army to emerge from the road-bound age of motor transport."

NOTE: See also "Flying in the 'Blowtorch' Era," in the *National Geographic Magazine* for September, 1950; "Exploring Ancient Panama by Helicopter," February, 1950; "Our Air Age Speeds Ahead," February, 1948*; "New Frontier in the Sky," September, 1946; "Air Power for Peace," February, 1946; "Your New World of Tomorrow," October, 1945*; and "Aviation in Commerce and Defense," December, 1940.

EDWIN L. WISHERD

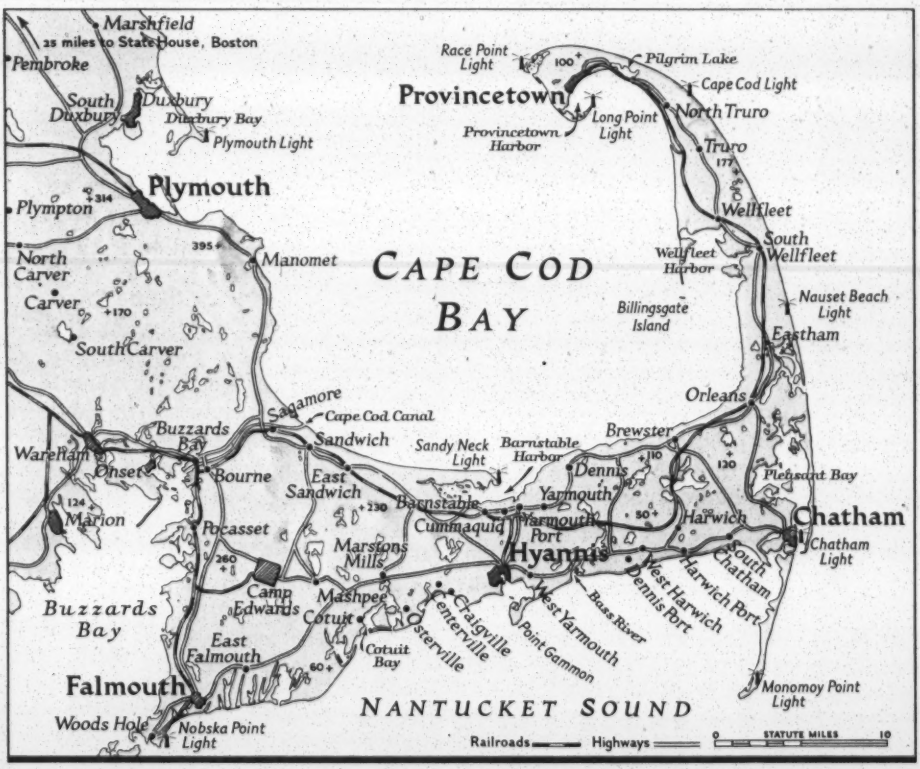
THE COAST GUARD WAS THE FIRST TO USE HELICOPTERS IN RESCUE OPERATIONS

At Salem, Massachusetts, a "flying windmill" demonstrates how it can hang motionless in air and then go straight up or down. In this manner, it can hover over shipwrecked persons and take them aboard. The vessel is a replica of the *Arbella*, which in 1630 brought the Puritans to Salem.

generally credited with discovering it. He found the waters teeming with codfish, and it was he who named the cape. The Pilgrims dropped anchor at the tip of the cape and stayed there five weeks before sailing on to make their permanent settlement at Plymouth.

In the 1800's, Cape Cod was a center of America's booming whaling industry. In the present century came its popularity as a summer resort.

NOTE: Cape Cod is shown on the Society's map of the Northeastern United States. For additional information, see "Cape Cod People and Places" (with 24 color photographs), June, 1946*.



DRAWN BY THEODORA PRICE AND IRVIN E. ALLEMAN

LIKE A COCKED ARM, CAPE COD ELBOWS INTO THE ATLANTIC

Cape Cod Canal cuts the cape from the rest of Massachusetts and shortens the water route from Boston to New York by 70 miles. Hyannis and Provincetown are the two main centers for summer vacationists—many of them lured by the cape's 200 miles of beaches.

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